Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently amended) An optical assay device for the detection of an analyte of interest in a fluid sample comprising:

a support containing channels;

an optically functional layer, an optical property of which is detectably altered upon a change in mass on said optically functional layer related to analyte binding, positioned on said support;

an attachment layer positioned on said optically functional layer; and

an analyte specific receptive layer positioned on said attachment layer,

wherein said support, optically functional layer, attachment layer, and analyte specific receptive layer are configured and arranged (i) to provide channels that are continuous through each of said layers ~~that are continuous with said channels in~~ of said support, and (ii) to provide laminar flow of sample through said channels of said device from the surface of said device towards said support when a fluid sample is introduced into said device.

2. (Currently amended) An optical assay device for the detection of an analyte of interest in a fluid sample comprising:

a support containing channels;

an optically functional layer, an optical property of which is detectably altered upon a change in mass on said optically functional layer related to analyte binding, positioned on said support; and

an attachment layer positioned on said optically functional layer to provide nonspecific capture of said analyte,

wherein said support, optically functional layer, and attachment layer are configured and arranged (i) to provide channels that are continuous through each of said layers ~~that are continuous with said channels in~~ of said support, and (ii) to provide laminar flow of sample through said channels of said device from the surface of said device towards said support when said fluid sample is introduced into said device.

3. (Previously presented) An optical assay device for the detection of an analyte of interest in a fluid sample comprising:

a porous support;

an optically functional layer, an optical property of which is detectably altered upon a change in mass on said optically functional layer related to analyte binding, comprising discrete, optically functional particles embedded in said support configured and arranged to provide channels through said optically functional layer;

an attachment layer positioned on said particles; and

an analyte specific receptive layer positioned on said attachment layer,

wherein said attachment layer and analyte specific receptive layer are configured and arranged (i) to provide channels through each of said layers that are continuous with said channels in said optically functional layer, and (ii) to provide laminar flow of sample through said channels of said device from the surface of said device towards said support when said fluid sample is introduced into said device.

4. (Previously presented) An optical assay device for the detection of an analyte of interest in a sample comprising:

a porous support;

an optically functional layer, an optical property of which is detectably altered upon a change in mass on said optically functional layer related to analyte binding, comprising discrete, optically functional particles embedded in said support configured and arranged to provide channels through said optically functional layer; and

an attachment layer positioned on said particles to provide nonspecific capture of said analyte,

wherein said attachment layer is configured and arranged (i) to provide channels through said attachment layer that are continuous with said channels in said optically functional layer, and (ii) to provide laminar flow of sample through said channels of said device from the surface of said device towards said support when said fluid sample is introduced into said device.

5. (Currently amended) An optical assay device for the detection of an analyte of interest in a sample comprising:

a porous support;

an optically functional layer, an optical property of which is detectably altered upon a change in mass on said optically functional layer related to analyte binding, containing channels positioned on said support;

an attachment layer positioned on said optically functional layer; and

an analyte specific receptive layer positioned on said attachment layer,

wherein said attachment layer and analyte specific receptive layer are configured and arranged (i) to provide channels that are continuous through each of said layers ~~that are continuous with said channels in~~ of said support, and (ii) to provide laminar flow of sample through said channels of said device from the surface of said device towards said support when said fluid sample is introduced into said device.

6. (Currently amended) An optical assay device for the detection of an analyte of interest in a sample comprising:

a porous support;

an optically functional layer, an optical property of which is detectably altered upon a change in mass on said optically functional layer related to analyte binding, containing channels positioned on said support; and

an attachment layer positioned on said optically functional layer to provide nonspecific capture of said analyte,

wherein said attachment layer is configured and arranged (i) to provide channels that are continuous through each of said layers ~~that are continuous with said channels in~~ of said support, and (ii) to provide laminar flow of sample through said channels of said device from the surface of said device towards said support when said fluid sample is introduced into said device.

7. (Original) The device of any of claims 1, 2, 3, 4, 5 or 6 wherein said optically functional layer further comprises an antireflective layer.

8. (Original) The device of any of claim 1, 2, 3, 4, 5 or 6, wherein said attachment layer is nickel.

9. (Previously presented) The device of any of claim 1, 2, 3, 4, 5 or 6, wherein said device further comprises a liquid absorbent material surrounding said optically functional layer or beneath said support.

10. (Original) The device of any of claims 1, 2, 3, 4, 5 or 6, wherein

said support comprises polyester or polycarbonate,

said optically functional layer comprises a layer of silicon nitride positioned on a layer of amorphous silicon, and

said attachment layer comprises nickel.

11. (Original) The device of any of claims 1, 2, 3, 4, 5 or 6 wherein said support comprises polycarbonate or polyester, and

said optically functional layer comprises a layer of germanium on which is positioned a layer of diamond-like carbon.

12. (Original) The device of any of claims 1, 2, 3, 4, 5 or 6 wherein said optically functional layer comprises a layer of germanium on which is positioned a layer of diamond-like carbon, and said attachment layer comprises nickel.

Claims 13-17 (Cancelled)

18. (Currently amended) Method for constructing an optical assay device with laminar flow properties, comprising the steps of:

providing a support comprising channels;

providing an optically functional layer, an optical property of which is detectably altered upon a change in mass on said optically functional layer related to analyte binding, on said support;

providing an attachment layer on said optically functional layer; and

providing an analyte specific receptive layer on said attachment layer,

wherein said support, optically functional layer, attachment layer, and analyte specific receptive layer are configured and arranged (i) to provide channels that are continuous through each of said layers ~~that are continuous with said channels in~~ of said support, and (ii) to provide laminar flow of sample through said channels of said device, from the surface of said device towards said support, or through said channels of said device from the surface of said device towards said support and across one or more of said layers of said device when said fluid sample is introduced into said device.

19. (Currently amended) Method for constructing an optical assay device with laminar flow properties, comprising the steps of:

providing a support comprising channels;

providing an optically functional layer, an optical property of which is detectably altered upon a change in mass on said optically functional layer related to analyte binding, on said support; and

providing an attachment layer on said optically functional layer to provide nonspecific capture of said analyte,

wherein said support, optically functional layer, and attachment layer are configured and arranged (i) to provide channels that are continuous through each of said layers ~~that are continuous with said channels in~~ of said support, and (ii) to provide laminar flow of sample through said channels of said device from the surface of said device towards said support or through said channels of said device from the surface of said device towards said support and

across one or more of said layers of said device when said fluid sample is introduced into said device.

20. (Original) The method of claims 18 or 19, wherein said support contains channels.

21. (Original) The method of claims 18 or 19, wherein said support is porous and said optically functional layer comprises particles.

22. (Original) The method of claims 18 or 19, wherein said support is porous and said optically functional layer contains channels.

23. (Currently amended) A composition comprising:

a support comprising channels, and an optically functional layer, an optical property of which is detectably altered upon a change in mass on said optically functional layer related to analyte binding;

wherein said optically functional layer is configured and arranged (i) to provide channels that are continuous through each of said layers ~~that are continuous with said channels in~~ of said support, and (ii) to provide laminar flow of sample through said channels of said optically functional layer from the surface of said device towards said support when a fluid sample is introduced onto said optically functional layer.

24. (Original) The composition of claim 23, wherein said support contains channels.

25. (Original) The composition of claim 23, wherein said support is porous and said optically functional layer comprises optically functional particles.

26. (Original) The composition of claim 23, wherein said support is porous and said optically functional layer contains channels.

27. (Original) The composition of claim 23, wherein said support comprises polycarbonate and said optically functional layer comprises amorphous silicon.

28. (Original) The composition of claim 27, wherein said optically functional layer further comprises a layer of silicon nitride positioned on said amorphous silicon.

29. (Original) The composition of claim 23, wherein said support comprises polycarbonate and said optically functional layer comprises germanium.

30. (Original) The composition of claim 29, wherein said optically functional layer further comprises a layer of diamond-like carbon positioned on said germanium.

31. (Original) The composition of claim 23, wherein said support comprises polyester and said optically functional layer comprises amorphous silicon.

32. (Original) The composition of claim 31, wherein said optically functional layer further comprises a layer of silicon nitride positioned on said amorphous silicon.

33. (Original) The composition of claim 23, wherein said support comprises polyester and said optically functional layer comprises germanium.

34. (Original) The composition of claim 33, wherein said optically functional layer further comprises a layer of diamond-like carbon positioned on said layer of germanium.

35. (Cancelled)

36. (Previously presented) The device of any of claims 1, 2, 3, 4, 5 or 6, wherein said analyte is selected from the group consisting of antigens, antibodies, receptors, ligands, chelates, proteins, enzymes, nucleic acids, DNA, RNA, pesticides, and herbicides.

37. (Original) The device of any of claims 1, 2, 3, 4, 5 or 6 wherein said optically functional layer comprises a layer of silicon nitride positioned on a layer of amorphous silicon.

38. (Original) The device of any of claims 1, 2, 3, 4, 5 or 6 wherein said attachment layer comprises diamond-like carbon.

39. (Previously presented) An assay device for the detection of an analyte of interest comprising:

a support,

an optically functional layer positioned on said support, and

an attachment layer positioned on said support to provide nonspecific capture of said analyte, said attachment layer comprising diamond-like carbon.

40. (Previously presented) An optical assay device for the detection of an analyte of interest comprising:

a support,

an optically functional layer positioned on said support;

an attachment layer positioned on said optically functional layer comprising diamond-like carbon, and

an analyte specific receptive layer positioned on said attachment layer.

41. (Original) The device of claim 39 or 40, further comprising an analyte specific receptive layer positioned on said attachment layer.

42. (Previously presented) The device of claim 39 or 40, wherein said attachment layer non-specifically binds analyte selected from the group consisting of antigens, antibodies, receptors, nucleic acids, polysacchrides, lipopolysacchrides, enzymes, proteins, microorganisms, fragments derived from microorganisms, haptens, drugs, food contaminants, environmental agents, ligands, and chelators.

43. (Previously presented) The device of claim 41, wherein said receptive layer comprises biomolecules selected from the group consisting of antigens, antibodies, receptors, nucleic acids, polysacchrides, lipopolysacchrides, enzymes, proteins, microorganisms, fragments derived from microorganisms, haptens, drugs, food contaminants, environmental agents, ligands, and chelators.

44. (Original) The device of claim 39, wherein said diamond-like carbon is coated on said support to a thickness of 50 Å.

45. (Original) The device of claim 40, wherein said diamond-like carbon is coated on said optically functional layer to a thickness of 50 Å.

46. (Original) The device of claim 39, wherein said diamond-like carbon is coated on said support to a thickness of 50 to 3000 Å.

47. (Original) The device of claim 40, wherein said diamond-like carbon is coated on said optically functional layer to a thickness of 50 to 3000 Å.

48. (Original) The device of claim 39, wherein said diamond-like carbon is coated on said support by a process selected from the group consisting of ion beam technique, chemical vapor deposition, plasma deposition, ion beam gun, shock-synthesis technique, sputtering, thermal radio-frequency and microwave-supported plasmas, heated filament, direct current plasma, chemical vapor deposition, and plasma deposition.

49. (Original) The device of claim 40, wherein said diamond-like carbon is coated on said optically functional layer by a process selected form the group consisting of ion beam technique, chemical vapor deposition, ion beam gun, shock-synthesis technique, sputtering, thermal radio-frequency and microwave-supported plasmas, heated filament, direct current plasma, chemical vapor deposition, and plasma deposition.

50. (Original) The device of claim 39 or 40, wherein said diamond-like carbon comprises industrial diamonds.